

C L A I M S

1. A steel sheet for a tension mask excellent in the shielding properties from geomagnetism, said steel sheet consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, 0.4 to 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, 0.003 to 0.02% by weight of N, and the balance of Fe, and having an anhysteretic magnetic permeability of 5,000 or higher.

2. The steel sheet for a tension mask according to claim 1, wherein said anhysteretic magnetic permeability is 5,200 or higher.

3. The steel sheet for a tension mask according to claim 1, wherein said anhysteretic magnetic permeability is 6,000 or higher.

4. A method of manufacturing a steel sheet for a tension mask excellent in the shielding properties from geomagnetism, comprising the steps of:

obtaining a steel piece consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, 0.4 to 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, 0.003 to 0.02% by weight of N, and the balance of Fe; hot rolling said steel piece; cold rolling once or a plurality of times the hot-

rolled steel sheet with or without an intermediate annealing treatment interposed between the adjacent cold rolling processes so as to prepare a steel sheet having a predetermined thickness; and

5           annealing the resultant steel sheet under a temperature region not higher than the recrystallization temperature so as to increase the anhysteretic magnetic permeability.

5. The method of manufacturing a steel sheet for  
10       a tension mask according to claim 4, wherein said annealing step is carried out under a temperature range between the recrystallization temperature and 510°C.

6. The method of manufacturing a steel sheet for  
15       a tension mask according to claim 4, wherein said annealing step is carried out under a temperature range between the recrystallization temperature and 560°C.

7. A steel sheet for a tension mask excellent in both the shielding properties from geomagnetism and the creep resistance under high temperatures, said steel  
20       sheet consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, higher than 0.6% and not higher than 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol.  
25       Al, not lower than 0.006% and lower than 0.01% by weight of N, and the balance of Fe, and having an anhysteretic magnetic permeability of 5,000 or higher.

8. The steel sheet for a tension mask according to claim 7, wherein said anhysteretic magnetic permeability is 5,200 or higher.

5 9. The steel sheet for a tension mask according to claim 7, wherein said anhysteretic magnetic permeability is 6,000 or higher.

10 10. A method of manufacturing a steel sheet for a tension mask excellent in both the shielding properties from geomagnetism and the creep resistance under high temperatures, comprising the steps of:

obtaining a steel piece consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, higher than 0.6% and not higher than 2% by weight of Mn, not higher than 0.1% by weight of P, 15 not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, not lower than 0.006% and lower than 0.01% by weight of N, and the balance of Fe;

hot rolling said steel piece;

20 cold rolling once or a plurality of times the hot-rolled steel sheet with or without an intermediate annealing treatment interposed between the adjacent cold rolling processes so as to prepare a steel sheet having a predetermined thickness; and

25 annealing the resultant steel sheet under a temperature region not higher than the recrystallization temperature so as to increase the anhysteretic magnetic permeability.

11. The method of manufacturing a steel sheet for a tension mask according to claim 10, wherein said annealing step is carried out under a temperature range between the recrystallization temperature and 510°C.

5           12. The method of manufacturing a steel sheet for a tension mask according to claim 10, wherein said annealing step is carried out under a temperature range between the recrystallization temperature and 560°C.

10           13. A steel sheet for a tension mask excellent in the shielding properties from geomagnetism, said steel sheet being manufactured by the method comprising the steps of:

            obtaining a steel piece consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, 0.4 to 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, 0.003 to 0.02% by weight of N, and the balance of Fe;

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            hot rolling said steel piece;

20           cold rolling once or a plurality of times the hot-rolled steel sheet with or without an intermediate annealing treatment interposed between the adjacent cold rolling processes so as to prepare a steel sheet having a predetermined thickness; and

25           annealing the resultant steel sheet under a temperature region not higher than the recrystallization temperature so as to increase the

anhysteretic magnetic permeability.

14. A steel sheet for a tension mask excellent in both the shielding properties from geomagnetism and the creep resistance under high temperatures, said steel  
5 sheet being manufactured by the method comprising the steps of:

obtaining a steel piece consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, higher than 0.6% and not higher than 2%  
10 by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, not lower than 0.006% and lower than 0.01% by weight of N, and the balance of Fe;  
hot rolling said steel piece;

15 cold rolling once or a plurality of times the hot-rolled steel sheet with or without an intermediate annealing treatment interposed between the adjacent cold rolling processes so as to prepare a steel sheet having a predetermined thickness; and

20 annealing the resultant steel sheet under a temperature region not higher than the recrystallization temperature so as to increase the anhysteretic magnetic permeability.

15. A tension mask formed of a steel sheet  
25 consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, 0.4 to 2% by weight of Mn, not higher than 0.1% by weight of P, not higher

than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, 0.003 to 0.02% by weight of N, and the balance of Fe, and having an anhysteretic magnetic permeability of 5,000 or higher.

5           16. A tension mask formed of a steel sheet consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, higher than 0.6% and not higher than 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of  
10       S, not higher than 0.01% by weight of sol. Al, not lower than 0.006% and lower than 0.01% by weight of N, and the balance of Fe, and having an anhysteretic magnetic permeability of 5,000 or higher.

          17. A cathode ray tube comprising a tension mask  
15       formed of a steel sheet consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of Si, 0.4 to 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by weight of sol. Al, 0.003 to 0.02%  
20       by weight of N, and the balance of Fe, and having an anhysteretic magnetic permeability of 5,000 or higher.

          18. A cathode ray tube comprising a tension mask formed of a steel sheet consisting essentially of lower than 0.1% by weight of C, lower than 0.2% by weight of  
25       Si, higher than 0.6% and not higher than 2% by weight of Mn, not higher than 0.1% by weight of P, not higher than 0.03% by weight of S, not higher than 0.01% by

weight of sol. Al, not lower than 0.006% and lower than 0.01% by weight of N, and the balance of Fe, and having an anhysteretic magnetic permeability of 5,000 or higher.

- 5           19. A method capable of improving a magnetic properties of a steel sheet for a tension mask, comprising the steps of preparing a cold-rolled steel sheet and annealing the cold-rolled steel sheet under a temperature region not higher than the
- 10           recrystallization temperature so as to increase the anhysteretic magnetic permeability.